

WHAT IS CLAIMED IS:

1. A method for fabricating high-purity silica glass using a sol-gel processing, comprising the steps of:

5 (a) mixing deionized water with a fluorine compound and a dispersion agent to prepare an aqueous premix solution;

(b) mixing the aqueous premix solution with a fumed silica;

(c) mixing the resulting mixture to form a dispersed sol;

(d) aging the dispersed sol at the ambient temperature to stabilize silica particles;
10 and,

(e) removing air voids from the sol and adding a gelation agent.

2. The method of Claim 1, wherein the fluorine compound added in the preparation step (a) of the aqueous premix solution is NH_4F .

3. The method of Claim 1, wherein the fluorine compound added in the preparation step (a) of the aqueous premix solution is $(\text{NH}_4)\text{SiF}_6$.

4. The method of Claim 1, wherein the fluorine compound added in the preparation step (a) of the aqueous premix solution is HF .

5. The method of Claim 1, wherein the dispersion agent used in the mixing step (b) is tetramethylammonium hydroxide.

6. The method of Claim 1, wherein the gelation agent used in the defoaming step (e) is any one selected from the group consisting of methyl formate, methyl lactate, and ethyl lactate.